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ABSTRACT

The role of education is strongly determined by the perspective set by the political and social fabric of a given culture. Political and social upheaval, experimentation, and change accelerated at a tremendous pace during the 1960s and early 1970s. Consequently, great changes occurred in the structure of many school systems throughout the nation. Development of the basic skills needed to function effectively as mature, participating adults has been sorely affected by the change in the educational milieu. Structure emerges as a consistent factor in contemporary research. The structure cited is positively correlated with basic skills achievement in an increasing number of studies. There is emerging today a return to more enduring values and reestablishment of control in every educational sector. (Author/MLF)

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THE
ROLE OF
STRUCTURE IN BASIC
SKILLS AND CURRICULUM DEVELOPMENT

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Bruner remarked in The Process of Education that "structure is the key to transfer."¹ Gagne hypothesized that "a structure exists for learning any given task."² Duncker wrote of psychological constructs that "it can be directly shown as a phenomenal fact that the individual properties are joined into one unified model of the thing, each in its specific position in the structure."³ de Hirsch wrote that "most teachers prefer structured programs because the participating children tend to pose fewer disciplinary problems than do those in more loosely organized ones."⁴

When one considers educational authorities one encounters, interminably, structure. Structure occurs at all levels and in all elements, no matter how diverse, and in keeping with its universal presence may be viewed as a basic tenet of educational theory and practice. As such its consideration, in terms of learning theory, curriculum planning, basic skills, and procedural practice, presents it as a relevant variable to be reckoned with in educational practice, training, and research. In fact, the rules of structure, as regard education, may be assumed to precede definition, and, are stipulated by the nature of man, the environment, and their interaction in the learning process.

Just what is structure? Random House Dictionary of the English Language provides many definitions, three of which appear in-line with "The Role of Structure in Basic Skills and Curriculum Development." They are

3. the manner in which the elements of anything are organized or interrelated,
4. anything composed of organized or interrelated elements, (and,)
9. to give a structure, organization, or arrangement to; construct a systematic framework for.⁵

It is in the nuclei of the foregoing definitions that the variable of structure enters into this presentation.

For purposes of this presentation structure is defined as that educational program description which can be abstracted out of a focal plane and describes the intra-inter relationship framework upon which dimensional units tend to coalesce and derive their characteristic form and function.

It seems particularly appropriate that the theme for the First Congress on Education is "Educational Policy and the Choice of Futures."⁶ In developing the role of structure in a thematic perspective education will be defined as a process of conveying knowledge, developing reasoning, nurturing judgment, and structuring behavior in a systematic, planned environment--the school. Policy will be viewed as a set of procedures conforming to the needs arising out of the nature of an institutional body; while, choice will be described as the right or opportunity to select. Futures are regarded as states, functions, or roles. Following this line of reasoning a situation specific interpretation of

the educative framework as a systematic, procedural process for formal acculturation will be advanced as it relates to some future state or existence, with the implications of the choice factor advanced on a global (total educational) as well as specific (individual student) viewpoint. This means that policy is viewed as stipulating educational direction. Consequently, alternatives of futures exist for education, each with idiosyncratic implications. Ultimately, policy and its direction are viewed as providing students with the ultimate choice, or lack thereof, of deciding upon their own futures. This implies that the educators have, in effect, choices to make. The choices that educators make subsequently determine the choice, type of choice, or relative lack of choice that the students are capable of taking advantage of. Choice begets choice!

Statement of the problem

Education's role is strongly determined by the perspective set by the political and social fabric of a given culture. Political and social upheaval, experimentation, and change accelerated at a tremendous pace during the 1960's and early 1970's. Education, in its peculiar reactionary role, depended upon the socio-political framework for structure, content, and function. As this framework was modified, distorted, or ruptured--schools reacted accordingly. Consequently, great changes occurred in the structure of many school systems throughout the nation. The traditional was swept away by the innovative.

Upheaval has waned considerably, and the results of experimentation and change have been coming in. As these results are tabulated the realization dawns that, despite significant change in the socio-political fabric, the same basic skills are needed to function effectively as mature, participating adults. Yet, according to many reports, development of these basic skills has been sorely affected by the resultant change in the educational milieu. Structure, in its traditional form, has been altered, distorted, or even extirpated. This is a great cause for alarm as structure, and its concomitant expression curriculum, are oftentimes viewed in a production line acculturation vein.

The problem, then, rises out of the mismatch between school structure and the nature of learning--resulting in a gradual prolonged decline in student achievement, college board, national teacher examination, and other score indices of educational efficiency. The role of structure in basic skills and curriculum development has been violated. The potential effect of technological development, financial expenditure, and educational progress has been largely dissipated with the concomitant effect upon student achievement.

A further exacerbation of the structural mismatch problem exists in the control of educational direction. A change in this control has been occurring over recent years. This change has resulted in a stabilization of educational policy and procedures, as well as a return to a more traditional educational expectation--achievement. The return to achievement is epitomized in the back-to-the-basics movement. Stabilization of educational policy and procedure is best reflected in the establishment of minimal competency testing as well as a return to standards and slowdown of innovation. The struggle for control is being resolved as society reasserts its values by imposing controls upon the educational bodies through legislation of minimal competencies and standards institution or revival during the 1970's. Exacerbation occurs as those relieved of control rail against those who would have them desist from imposing inhumane practices upon their charges in the name of humanity.

As some would state it--the pendulum is reversing itself. There is emerging today a return to more enduring values, a reestablishment of control in every educational sector. We are returning to an emphasis

upon cognitive development and must accordingly emphasize curriculum development to better obtain it. That is to say, we are in the process of restructuring our educational system.

Background

Sputnik (1958) ushered in an era of educational change. In an affluent society embarking upon a space and technological race, education was singled out as the scapegoat, and change became the order of the day in a race for space. The ensuing era of innovation, experimentation, and change in education was intensified by political (the cold war, a hot war, the assassination of a president, the resignation of a vice-president, and subsequent sacking of a president, etc.), and social (race riots, flower children, morals disintegration, penal permissiveness, divorce, mobility, etc.) events which orchestrated the field via media, parents, students, staff, school boards, and whatall. Basic skills were often innovated away in a wholesale attempt to substitute the end products of education in some reducible form for the exercises leading to those end products. The teaching of transfer, death education, social behavior, attitudes, values, emotions, expression, creativity, aesthetics, structure, and whatever else was garnered into the curriculum. Throughout this evolution educational structure underwent tremendous change.

Perhaps a primary architect in these structural changes in education was the flowering of existential philosophy. Now existentialism may be defined as:

A modern movement encompassing a variety of themes, among them the doctrine that individual existence determines essence, that man has absolute freedom of choice but that there are no rational criteria serving as a basis for choice, and the general claim that the universe is absurdly with an emphasis on the phenomena of anxiety or alienation.

In viewing the preceding definition it is but a short jump to trace the evolution of existentialism in politics and society, as well as its influence upon education. In the latter area, education, we are particularly interested in the influence of the existential viewpoint upon structure.

Whereas the stabilizing influences of nationalism, professionalism, cognitive learning, authority, discipline, subject centration, learning for learning's sake, religion, and the "one for all and all for one" mentality exerted a tremendous tractiveness upon education during the 1950's, the 1960's proved another story.

Existentialism reigned during the late 1960's and early 1970's. As such, rampant egocentrism, glorification of divergence from the norm, standards attack, destruction, or distortion, unbridled experimentation, radicalism, the concomitant denigration of nationalism, innumerable conflicts for control, personal world ordering, inculcation of personal values into students, individual rights at the benefit of group rights, an excess of the affective, a loss of unity, tremendous mobility, the

exaltation of the bizarre or creative, a platform of incoherence and fragmentation, and reward by right or dole rather than earned privilege, were substituted, in so many instances, into the socio-political context with education's casual imitation, and the resultant effect upon the preparation of youth for the task of functioning in a complex world.

In brief, the basic skills were emphasized, or deemphasized as the case may be, and curricula were fragmented. Each individual became a generator of curricula with the resultant variations in exposure, skill development, and general preparedness for the task of living. The comprehensive frame, or structure, was torn asunder and substituted with varying degrees of structure, or structural lack thereof. In the face of technological advance and research findings, we began producing graduated and certificated illiterates, eminently unprepared for the task of living. Furthermore, many of the proprietors of dysfunction staunchly defend and cling tenaciously to programs of minimal fit, while some of the products of minimal fit education look to chinks of liability in the coat of potential malpractice.

Purpose

The purpose of this presentation is to abstract and analyze the role of structure in basic skills and curriculum development. This task necessitated a cursory review of the evolution of the role of structure over the recent educational decades. Additionally, the following objectives are postulated for this presentation:

1. The intent is to define a problem from a given perspective.
2. The intent is to review an emerging research trend.
3. The intent is to explain the nature of a research problem as it concerns the role of structure.
4. The intent is to consider the evolution of structure over the last decades and into the near future.
5. The intent is to consider selected aspects of the role of structure in basic skills and curriculum development.
6. The intent is to highlight some recent research findings and their implications.
7. The intent is to provide selected valuable references for self-examination of relevant information.

It is anticipated that realization of the stated objectives will determine the success of this presentation. Perhaps the most significant determiner for this anticipation lies in the review of the literature section. A review of the information cited in the literature review section should benefit the reader.

Literature review

A burgeoning body of thematic research literature has been emerging over the past several years. This literature reflects consistently upon the role of structure in a basic skills achievement - curricular (program) vein.

Emerging literature basically consists of an action-reaction type of flow. Occasionally, outstanding reviewers separate personal philosophy from analytic treatment and produce objective reports of crucial principles. Consequently, this review section will contain references to some of the reported studies involving the role of structure, and, in selected instances, references to general critical works. This review section is not intended to be comprehensive, yet, it is intended to portray a particular theme, the theme of structure in a basic skills - curricular relationship.

An early study on the role of structure in learning was reported by Grimes and Allensmith.⁸ These researchers scrutinized the role of structure as it related to reading achievement and anxiety. In their findings the authors reported that the degree of structure was related to the degree of anxiety. Whereas high anxious Ss were reported to function best in situations involving high structure, low anxious Ss were reported to be unaffected by the particular level of structure. The implications of this study are parallel to those of Hunt's Conceptual Matching Model.⁹

Hunt presented a conceptual matching model in 1973. This model is depicted as providing a high educational structure for low conceptual level Ss, and a low educational structure for high conceptual level Ss. The author's intent was to provide a model for matching the degree of structural need with the appropriate structure, based upon the conceptual level of the S.

Perhaps the most controversial study in the USA concerning structure was conducted by Abt Associates for the USOE.¹⁰ Abt Associates reported that basic skills programs high in structure were more effective than other approaches in the evaluation of Follow Through, a five year planned variation project for disadvantaged students. Follow Through model conceptualizations, as determined by Abt, were basic skills, cognitive/conceptual, and affective/cognitive.

Abt Associates' study received mixed reactions from the educational community. A largely critical reception was officially accorded by House, Glass, McLean, and Walker,¹¹ compliments of a Ford Foundation grant, as the authors analyzed the Abt findings. The basic gist of the House, et al. report was that insufficient evidence exists to conclude that the basic skills approaches demonstrate achievement superiority over other approaches for the indigent. The authors concluded that the major finding of the study, however, was valid.

This finding was that "The effectiveness of a teaching approach varies greatly from one school district to the next."¹² Criticism was based upon classification, measurement, and fairness problems.

Becker and Englemann¹³ reported implications of the Abt study via histogram. The implications they noted were highlighted by neither Abt nor House, et al., and were purported to have significant implications for the direct instruction (i.e., structured) teaching model.

Bennett's research, published in a book entitled Teaching Styles and Pupil Progress,¹⁴ involved assessment of student achievement in reading, English, and math (1976). Bennett reported that on the basis of third and fourth grade achievement test analysis, formal or traditional schooling demonstrated significant achievement results by students over open or informal schooling.

The British version of the report, according to Choppin, "aroused enormous controversy."¹⁵ The controversy appeared to stem from the nature of Bennett's report that indicated warm, orderly, task-oriented, systematic classroom climates are superior to informal classrooms that are not. Bennett's conclusion that carefully planned teacher direction of clearly structured and sequenced learning situations was central to student achievement probably sparked much of the registered controversy.

Barak Rosenshine¹⁶ reviewed Bennett's book and much of the controversy. Rosenshine aptly focused upon the implications of the study, while recognizing the deficiencies. He also called attention to the emerging pattern of corroborating research results.

Wilder presented the results of a USOE funded research project conducted by ETS.¹⁷ The study dealt with an analysis of effective compensatory reading program characteristics in the US (Title I). Research findings indicated that five schools with little commonality had salient characteristics. These characteristics included the outstanding characteristics that careful attention was paid to the basic skills, written evidence of careful thought and planning for instruction across teachers existed, and classroom structure was significantly and positively related to achievement at the second grade, a null relationship existed at the fourth grade, and a negative correlation existed at the sixth grade levels. All five schools had been carefully selected for characteristic analysis due to the outstanding nature of their student achievement. In examining the ineffective schools, Wilder reported that the salient characteristics of these schools were negatively related.

Solomon and Kendall's¹⁸ fifth grade study reported results similar to those of Abt, Bennett, and Wilder. The researchers found that the highest achievement gains occurred in formal classroom climates. Additionally, creativity and self-esteem gains for classrooms typified by structure were reported favorable, according to the degree of warmth (student teacher

relationship), with high warmth classrooms demonstrating good gains. The researchers found that order, teacher direction, and positive reinforcement were characteristics of effective classroom instruction as measured by student achievement.

Innumerable other references to structure and the basic skills, with implications for curriculum development, appear regularly in the literature. The remainder of this review section will be devoted to consideration of some of the more notable references.

Moore and Kennedy wrote that

Units in the language arts have a structure, and it is only an understanding of that structure that keeps what is essentially a rigorous discipline from degenerating into a "potpourri" of social amenities, telephone conversations, etc. The determination of a structure of a unit serves to identify both the content and the behaviors and to give the teacher a clear look at what he is about. Without a table of specifications for a unit, it is easy to lose touch with what the interrelationships are and to view the unit as a mixture of this or that bit of content or skill. Further, a table of specifications for language arts units facilitates the development of testing items and evaluation procedures by illuminating the structure of the units.¹⁹

Bruner²⁰ wrote that unless detail is placed into a structured pattern it is quickly forgotten, and advocated that structure is the key to transfer.

Ellson,²¹ after considerable analysis of 20 outstanding reading programs, reached the conclusion that the one common feature was careful engineering and rigid application. Ellson demonstrated surprise that the successful reading programs were inclined to exclude creative teaching practices.

Wright²² wrote that variable difference directions for open school children demonstrate academic area deficiencies. Wright then continued to suggest possible reasons for the deficit, including the observation that the curriculum was less amenable to modification and more rigid in structure. Wright took the findings to mean that a more structured approach may be better to achievement.

Ausubel²³ is known for his research with advance organizers. Advance organizers constitute a type of prestructuring activity. Torrance²⁴ has written on guided learning, Rothkopf²⁵ on mathemagenics,

and Gagne²⁶ on task analysis. As the work of some of the more renowned psychologists and educators is examined--the role of structure in learning, curriculum, and instruction appears to grow in magnitude.

In bringing the literature review section to a close, perhaps it is appropriate to refer to structure's abstracted and concretized representative--the model. On this aspect of structure Aristotle wrote: "If we have it as a model, it will be said, we shall be better able to know what is good for ourselves; and if we know what is good for ourselves, we shall be more likely to obtain it."²⁷

The Role of Structure in Basic Skills Development

Analysis and synthesis of a representative portion of the material presented throughout this paper would appear to strongly indicate that the role of structure is critical to effective basic skills achievement. This view is strongly reinforced when the stances of some of the leading educators are examined, and the nature of learning, instruction, and behavior examined.

Consideration of the basic skills in a maximally effective learning context would serve to indicate that structure plays a crucial role in the basic skills dimensions of memory (Bruner), comprehension (Ausubel), analysis (Gagne), creativity (Torrance), time-on-task (Rosenshine), reinforcement (Travers), and others. The role of structure would range from serial learning of the type required for learning an alphabet, to the type required for learning a poem, to the higher order thought processes necessary for synthetic and evaluative type thinking operations.

In the affective domain²⁸ anxiety (Grimes and Allensmith), discipline (de Hirsch), behavior, independence, values, attitudes, emotions, and other dimensions would appear to be significantly influenced by the structural dimensions of the cognitive domain²⁹. This is intended to imply that--affective development is strongly influenced by the cognitive domain, as it were, and shapes and directs affective development; a viewpoint that will not appear in a favorable light to those whose minds are inclined to the contrary.

On a more global level--the role of structure in basic skills development becomes one of learner support and development. For instance, provision of one structural type (high structure), with little variation, would appear to ill equip a student for or expedite the development of that characteristic to which education should direct itself over the years--learner independence. Independent learners with well-developed basic skills would appear to be ready for the ultimate aim of education--inheritance of the society.

As children make the transition to the structured learning environment, the school, relative to their degree of familial and cultural preparation, should be prepared to accommodate them according to their structural needs. Commensurate with S structural differentiations that occur is the fact that Ss are structurally undifferentiated in the formal academic sense. Consequently, structure in the beginning phase of school should be high so that the burden of structured behavior is not placed upon the unprepared learner. As Ss move up the curriculum, i.e., grade ladder, the degree of structure should be lessened according to the preparation of the Ss for the task at hand. Some situations, however, would always seem to necessitate high structure, and, failure to provide adequate structure is synonymous with presumption that children are adults and structure is not necessary, a presumption that proves invalid for many adults.

who need structure in order to function effectively.

Perhaps the role of structure and structured activities in the psychomotor domain³⁰ is one of the easiest to substantiate. Conversation with any successful coach or physical education instructor should provide valuable information relative to effective acquisition of basic skills in this area. Indeed, one of the more trenchant descriptions of the implications for learning structures was reported in the psychomotor area when Singer wrote that:

The command technique is associated with the formal, structured environment in which learning is heavily guided towards specific outcomes. It is considered behavioristic (Singer and Dick, 1974) because strong control is exerted over the learner's method of progress. ...In contrast the discovery method approach to instruction allows the learner to experiment and to explore solutions to problems (p. 481)³¹

Most theorists were reported to disagree about the value of errors in learning. Singer reported that:

The advocates of error minimization in the learning process suggest that learning, especially early learning, should remain error free....It is believed that undesirable responses will impair later learning (p. 482).³²

Singer's advice would appear to be well-taken, especially when one considers the role of the school in bridging the gap between the home, readiness, and basic skills development, and, the implications of errors for attitude formation, self-esteem, self-concept development, independence, and peer reinforcement. Error laden learning at early school levels would certainly appear to have a deleterious effect upon the preceding developmental dimensions.

It would seem, based upon an analysis of the characteristics of psychomotor learning, that many of the tenets are shared by cognitive learning, a viewpoint that would not have been particularly acceptable by some segments of the population a number of years ago, and, probably is not today. The cognitive-psychomotor learning patterns and their cross-domain implications would appear to represent an exceptionally good area for research, and might contribute much to basic skills and curriculum development.

In closing this section on the role of structure in basic skills development it might be more appropriate to approach the issue from the vantage point of structures--as--interactions occurring among the structural dimensions of teacher behavior, student behavior, environment, task, content, cognitive activity, and curriculum. Once the basic skills parameters have been set, and the structures established, the human element must energize those structures to make them meaningful. Meaningfulness is determined by structural match and its relationship to basic skills achievement.

The Role of Structure in Curriculum Development

The question of how content should be sequenced or ordered has been the subject of educational debates for at least the past 70 years (Dewey, 1902; Rugg, 1927; Tyler, 1950; Taba, 1962; Ausubel, 1964; Bruner, 1960; Suppes, 1966; Gagne, 1970; Popham and Baker, 1970; Posner, 1974). However, no satisfactory answer has been developed, and no adequate prescription is expected in the near future (Posner & Strike, 1976).³³

The preceding state of the art portrayed by Posner and Strike would seem to present a rather bleak picture. However, the use of a model to sequence and order curriculum would appear to contain much utility value, and, move curriculum development closer to the realm of a scientific enterprise. This is in contrast to Tyler's statement that "curriculum development, as we all know, is not a science."³⁴ Goldhammer echoed Tyler's view when he wrote that:

Probably one of the most serious deficiencies in education today is the absence of discrete systems for the application and utilization of knowledge. Curriculum development has been characterized more by an existential dependence upon intuition and experience than a sound application of knowledge about teaching and learning.³⁵

The issue in curriculum development becomes one of -- how do we make curriculum development more scientific? How do we rectify the serious deficiencies triggered by the absence of discrete systems?

It is believed that the answer to the preceding questions, and others of a similar bent, is to be found in research on structure in learning, instruction, and curriculum. Research of the type reported by Grimes and Allensmith, Abt, Bennett, Wilder, Solomon and Kendall, and others should do much over the long run to rectify the situation described by Tyler and Goldhammer. As the intricacies of structure and its influence on learning and instruction are unravelled, curricula of greater accommodation and fit will be developed and implemented.

Curriculum development appears to be a very trendy affair, moving in rhythm to the socio-political context. This is probably a more serious shortcoming to basic skills achievement and curriculum development than any other facet, even those noted by Tyler and Goldhammer. The implications for loss of structure would appear to be disastrous.

On another aspect of curriculum Miel was quoted in a published interview in answer to the question "Is the field of curriculum dead?" She replied:

If people don't like where a field or practice is going, that's fine, but that doesn't mean curriculum is dead. It's true, we're still in a primitive state, but progress is occurring over the years. ...³

Miel continued that:

Three variables must be manipulated in curriculum planning--content, environment, and teaching. These are also manipulated in instruction. (See Footnote 36).

In considering the sequencing and ordering of content, and the state of the art expressed by Tyler and Goldhammer, a vague sense of the condition of curriculum development begins to manifest itself. Vague is employed here because, at best, indications are that curriculum in general is in a rather amorphous state, i.e., lacking in structure.

Analysis of effective school curricula, as measured by student achievement scores, would indicate, as reported in the literature review section of this paper, that effective curricular characteristics appear to be common across programs. This indicates that curriculum has, as is readily determined by gross observation or examination of available documentation, distinctive structural characteristics. It is the organization and emphasis given to the aforementioned structural characteristics that gives curriculum its distinctiveness, and, results in a maximal match and accommodation, or relative mismatch thereof, influencing student achievement in the basic skills area.

The problem of curriculum appears to be, then, one of structure. As such, questions such as--how do we develop or structure curriculum begin to arise--and--the developmental process referred to by Goldhammer employing "existential dependence upon intuition and experience"³⁷ is employed in answering the question.

Another structural problem of curriculum development happens to be the trendy nature of education. It sometimes appears that curricula are piecemeal operations with patchworks applied as the field of education reacts to the issues surfacing in the socio-political structure. This interpretation would appear to have some corroboration in Randolph's statement that:

Educators have attempted to be responsive to a wide spectrum of public concerns ranging from Hiroshima to Watergate, and in the attempt to be responsive, the schools have almost lost their credibility.³⁸

Now then, responsiveness in the preceding fashion would result in a structural treadmill or lazy Susan. This has been, in many instances, the case. Low structure curricula have been developed, or in some instances, little development has occurred at all and each teacher functions in the fashion alluded to by Goldhammer.

The former situation was probably not the rule up to the latter 1950's. Although different schools of thought and practice existed formerly, the mollifying influences of the socio-political structure and advancing technology provided stabilizing structures that resulted in continual growth as more of the population received education. As the schools entered the 60's under influence of a changing socio-political field, such aspects of curricula as standards, reading lists, written curricula, fragmentation due to field breakdown, and the subsequent disappearance of a common exposure and skill development, began to be reflected in basic skills achievement. As the curricula, which previously had been somewhat static, became more mobile and lost structure due to the erosion of core experiences, standards, and more disciplined courses, the decline of student achievement in the basic skills areas accelerated. This decline, subsequently, has been reflected at most levels of achievement assessment--including CEEB's, NTE's, NAEP, and others, as reported previously.

It now appears that structure is being reestablished in the curricula. In many areas reestablishment of a degree of structure has been attributable to students, parents, and legislatures. In effect, a degree of control has been wrested from the educational community, as "the schools have almost lost their credibility."³⁹

According to Rausch, three major language arts curricular trends have evolved. They are: 1) knowledge-centered, 2) skills-centered, and 3) student-centered.⁴⁰ The descriptions of these curricula are similar to curricula described in the research, and the salient aspects characterizing each serve to give it structural identity.

In developing curricula one effective method is to employ a structured approach. Employment of a structured approach can result in a greater utilization of available talent and production of a high structure curricula that enables maximal accommodation for teachers and students according to the degree of need.

Discussion

A considerable amount of caustic criticism is being generated about contemporary research findings deriving from educational innovations instituted during the 60's and 70's. This criticism comes as more sophisticated research examinations begin to specify the effects of some of those innovative programs upon student achievement in the basic skills. In many instances the findings corroborate one another--especially across studies. In criticizing the studies, however, each one is attacked singularly and methodological or other weaknesses become the primary focus.

Structure emerges as a consistent factor in these contemporary studies. The structure cited is positively correlated with basic skills achievement in an increasing number of studies.

Two primary studies generating criticism are those of Bennett⁴¹ and Abt Associates⁴². In the case of the latter, Abt Associates (Follow Through), major controversy has emanated from various sources. Not the least vocal of this criticism is that of House, Glass, McLean, and Walker⁴³.

Bennett's study constitutes the British critical counterpart of Abt Associates. The findings of Bennett's study have received wide coverage at home and abroad. Consistent parallels emerge in both studies. These parallels indicate that structure, as defined by the researcher, is positively correlated with school achievement.

Studies of the Bennett-Abt type would seem to indicate that we are on the verge of a tremendous advance in educational research. As studies of this nature continue to emerge the case built for the role of structure in basic skills and curriculum development would appear to be a profound one--with significant implications for administrators, teachers, students, and achievement.

Bennett and Abt are not alone in their findings. Indeed--there exists a widespread return to structure in basic skills and curriculum. For instance, Harvard and California (Berkeley) are returning to core curricula composed of required subjects in order to provide a significant degree of institutional structure intended to remediate a perceived need. The controversy generated by these moves parallels that of Bennett and Abt.

State legislatures have been mandating a structured approach in basic skills and curriculum. They are using the law to restore structure to educational curricula in an attempt to reverse the decline in student achievement. The reaction to the apparition of control generated by the legislation of these governmental bodies has caused widespread criticism from diverse sources, a situation that parallels the return to core curricula at some of the leading universities in the U.S.A.

In widely divergent areas--at all educational levels--a pattern is forming. This pattern may be interpreted as a return to structure at these levels. Many of the innovative experiments and changes that had filled the niches of the recent structures are now tacitly considered failures by many, especially those in control. Obsolete would be too euphemistic a term and widely separated from the truth, as, in many of the instances reflecting a return to structure--the structures being returned to are those which had been ignominiously replaced in the headlong plunge into the innovative mania of the 60's and early 70's.

What significance do these returns to more traditional structures of the past have for education. The significance would appear to be of the highest order, for it indicates that the nature of man, his institutions, and his neurological development and function, are best suited to certain structural stereotypes in education, i.e., immutable laws. These stereotypes have been developed by man and are subject to the developmental eccentricities of his collective system. In turn they, the structural stereotypes, probably serve to further define man's structural needs in a continuous intercyclng process.

Does this mean to imply that we are returning completely to the old traditional structural modes in basic skills and curriculum? Hardly! It would seem that the experimental period has left its mark, and many of the more meritorious aspects of this adventurous period will be retained--ultimately resulting in upgraded educational program and function. However, it still remains to recover those aspects of basic skills and curriculum development that were discarded and contributed significantly to student achievement.

What we are "returning" to would appear to be a more viable curriculum. This curriculum, spawned by the period of experimentation and the subsequent research studies, should have a greater match between student needs and the potential for student accommodation. Whereas the curriculum being replaced was polarized in nature, polarities will be reduced in the new curriculum. Additionally, the new curriculum will emerge with a more multi-dimensional capacity. The resultant opportunities for improved student achievement in the basic skills areas should be significant. In brief, past "excesses" and "blunders" will have contributed considerable growth and wisdom to the emerging curriculum and basic skills learning.

When, you may ask, will the results be available? Next year? The year after? Based upon a cursory reflection of achievement patterns over the last three decades, the concept that curriculum and basic skills emphasis exert a cumulative effect measurable over decades and interpretable as patterns would seem to receive considerable support. Consequently, the results, measurable in highly differentiated curricula and improved basic skills achievement, will not be available for years to come. The initial indication of the influence of the return to highly structured curricula and basic skills emphasis will probably be a

leveling out or cessation of the declining achievement pattern. Then, as children mature and move upward in the curricula, the cumulative effect of education will effect a reversal of achievement patterns. After all, formal academic experience in a structured setting begins with enrollment in elementary school and continues throughout the high school years. Post secondary schooling, if elected, constitutes another stage of this process. It will take some time to restructure education, and a generation of children to validate the results.

We have been engaged in education as a science, a view that is contradicted elsewhere in this paper. As Skinner stated "Science is, of course, more than a set of attitudes. It is a search for order, for uniformities, for lawful relations among the events in nature."⁴⁴ In our search for order, uniformities, and lawful relations, the role of structure in basic skills and curriculum development is being analyzed and will eventually be validated.

It appears that we are unravelling the role of structure in basic skills and curriculum development, as indicated elsewhere in this paper. The process has been historically complicated by virtue of the fact that "A given pattern is only obvious to certain categories of people" (Hall).⁴⁵ Nevertheless, emerging research indicates that structure plays an extremely significant role in student achievement, and consequently, basic skills and curriculum development. In fact, "To the degree that the content is logically structured the learner will be influenced by the structure rather than by his human model" (Gage).⁴⁶ A point to be emphasized is that "Students learn skills by different routes" (Thelen)⁴⁷. "Even in the subjects at the center of the curriculum, such as reading comprehension, achievement is multi-dimensional". (Cronbach).⁴⁸ The multi-dimensional aspects of achievement are reflected in the multi-dimensional aspects of learners. Recent research findings are shedding considerable light on the multi-dimensionality of the learner-achievement relationship, which eventually will result in a reassessment of the structure of education, and the redesigning of educational structures for learners that will accommodate them in an improved curriculum-basic skills match. This improved match will result in a reversal of the decline in student achievement.

A Choice of Futures

In a later stage science advances from the collection of rules or laws to larger systematic arrangements ... It sets up a "model" of its subject matter, which helps to generate new rules very much as the rules themselves generate new practices in dealing with single cases (Skinner). 49

We are today on the threshold of a great revolution in education. That revolution is being orchestrated by recent events in the political, societal, and educational arena. It is a natural culmination of the disorder, fragmentation, and preoccupation with self that had gained control of the recent political and educational movement.

How, you may ask, can one ascertain that a revolution is in progress? Perhaps the best method of ascertainment would lie in defining the term revolution, and then making a determination if the defining attributes are present in sufficient quantity to justify such a label. We will now turn our attention to the definition and defining attributes.

A revolution may be explained as a radical change in society and the social structure. Something revolutionary, in the same vein, is subversive to established principles and procedures.

Many defining attributes are extant in the contemporary political, social, and educational context. Let's take a cursory look at selected aspects of the educational context and see if that is actually the case.

Statewide textbook adoptions are conducted in approximately 24 states. This practice has often been instituted for economic reasons, as well as to provide a degree of structure (control) over the educational diet of students. The practice has resulted in unexpected benefits by provision of other dimensions of quality control, as well as exertion of direct influence upon the textbook development process. It is anticipated that this practice will continue and expand into the 1980's, growing in the degree of influence and control that can readily be realized. The adoption process is highly structured in itself, and an attempt is made, via criteria implementation, to insure that the texts have the structural and content dimensions determined necessary to provide quality service.

A movement to develop new standards or reestablish former standards is gaining momentum. It is interesting to note that the structure of the core curriculum at California (Berkeley) is reported to be a resurrected core, similar to the core developed before the prestandards dissolution era of the 60's and 70's. Core curriculum is viewed as a structure consisting of a set of comprehensive standards.

Minimal competency legislation has been enacted in approximately 33 states. This movement has spread like wildfire, and may continue to grow as development and implementation problems are encountered and resolved.

Minimal competencies constitute standards of performance. Their institution, by legislation or volunteer adoption, has been a reaction to the curricular fragmentation, issues fixation, and failure of the educational community to solve its own problems through leadership and unified effort. Competencies have been enacted for a variety of reasons, not the least of which is the continual basic skills erosion that has been reflected in the declining achievement patterns. They may be viewed as an attempt to restructure the curriculum. Although many predict their demise, necessity dictates that they will become more prominent in the 80's, although they may not necessarily be in exactly the same form or under the same name.

PL 94-142⁵⁰ may be viewed as an attempt by the federal government to provide a structured accommodation for students where no or erratic accommodation existed previously. The structure of the law, including the IEP's, is in many instances analogous to governmental efforts to implement other structures aimed at benefiting segments of the educational and social communities. The highly structured formats of Titles I, IV, Bilingual, and Right to Read⁵¹ programs all appear to be directed at different facets of a common structural problem--curriculum development and accommodation of individual differences for special needs. An increasing degree of federal involvement in educational program influence is anticipated over the next decades, especially in the area of basic skills.

Accountability, which has caused much controversy in its own right, will result in more highly structured educational programs. Accountability, by its nature, can force a move away from the more nebulous, amorphous operations advocated by some, and result in highly delineated operations with more significant implications for basic skills development. It is anticipated that the accountability problem will be resolved during the 80's as curriculum and instruction advances act to deflate its significance.

Criterion-referenced testing constitutes a structural movement in which some proponents advocate replacement of one type of test and measurement structure (norm-referenced) with another (criterion-referenced). The motivation in this case appears to be instructional, with a strong social factor. On the other hand, criterion-referenced tests provide a valuable emphasis that contributes much to student development, and, in proper perspective, provide a degree of structural balance to the diagnosis and measurement dimension of education that was not formerly available. It would appear that criterion-referenced testing will fill an important role in the education of the 80's, but, it is not anticipated that norm-referenced testing will be discontinued.

Discipline has steadfastly emerged as a number one educational problem according to public education polls. Discipline is facilitated or impeded by curricular and basic skills structure. Research tends to substantiate this viewpoint. As curriculum and basic skills achievement are affected positively by a reemphasis of structure, it is anticipated that discipline in school contexts will be improved. Due to the nature of human development and the social fabric at this time, however, no projection is made outside that in the realm of curricula and basic skills. It would seem plausible that structural changes in the socio-political area will strongly influence discipline in the schools. As the courts and penal institutions move to reestablish structure and standards, school structures will be duly influenced into the 80's.

Closely related to the aspect of discipline is the issue of individual rights. Recent interpretations of rights issues have emphasized the rights of groups as well as individuals. Individual rights will be interpreted in the perspective of group rights into the 80's, with corresponding implications for discipline and school organization.

Greater parental involvement in educational planning and advising has been a result of federal emphasis. Title I and PL 94-142 are two sectors that have resulted in an expanded role of the parent. It is anticipated that the federal emphasis on this educational dimension will continue to expand into the 80's, resulting in a markedly different school structure. This aspect of program appears to be paralleling the return to a greater structure.

The affective education emphasis which has characterized many programs during the declining achievement period will be reprioritized and placed in a more balanced program format into the 80's. Recent research trends indicating that cognitive oriented programs high in structure accompanied by a positive classroom climate (i.e., warmth) are more productive in terms of basic skills achievement will serve to expedite this reorientation leading to better structured educational programs from teacher, student, and achievement perspectives. It would appear that the most direct route to affective development is the development of competence in the basic skills.

A cumulative body of research findings accentuating the effects of different organizational and curricular structures will be available to teachers and researchers as the results of contemporary research efforts begin to bear fruit. The structural relationship of different styled educational organizations, in effect, will be used to generate an increasing amount of curricular information, activating a cycle that should result in significant educational strides throughout the 1980's.

Basic skills deficit accounts are increasingly being reported by the colleges and universities. It would appear that at least a portion of the basic skills deficits being reported are attributable to dissolution of standards, trendism, and the breakdown in structure. It is anticipated that the return to greater structured curricula will result in solving much of this problem. As students are increasingly influenced by the improved curricula, their matriculation at colleges and universities should result in a reversal of the basic skills deficit problem, as mentioned earlier. However, the effectiveness of the solution will no doubt be dependent upon the degree of support provided by all aspects of the educational community in the movement to improve basic skills.

A considerable number of other issues that appear significantly related to structure in a basic skills-curriculum development perspective exist, however, they will not be covered in this paper. The purpose of this section, "A Choice of Futures," has been to highlight, through brief comments, a portion of the aspects of structure and basic skills development, and the projected trend.

We of the educational community, in conjunction with the socio-political communities, are in the process of choosing our future. Segments of this choice process, its dimensions, and its implications have been reviewed in this paper.

As we choose our future--we are choosing the future of our heirs. The survival of the democratic world community depends upon that choice.

"The Congress (does) come(s) at a time which may be considered an exceptional juncture in the development of education."⁵² As we make that choice, we should attempt to be scientific in the sense defined by Skinner at the beginning of this section.

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- ⁵¹Title I: A US federally funded program that provides special academic services for educationally disadvantaged children.

Title IV: A US federally funded program intended to facilitate educational innovations and library improvements.

Bilingual Education: A US federally funded program intended to provide special services for students with native tongues different than English.

Right to Read: A US federally funded program developed to spearhead the eradication of illiteracy.

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Selected Reading List

For

The Role of Structure in Basic Skills and Curriculum Development

Note: Familiarity with the materials listed in this bibliography should enable the reader to gain a good grasp of the implications of current research in the area of structure.

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